which a cavity of the size of a hickory nut exists in either lung; where bed rest and intelligent care for six months have failed to bring about improvement; and where pneumothorax has been tried and has proved unsuccessful because of adhesions.

Whatever position we take we are beginning to realize its great value in the treatment of tuberculosis. Physicians are keeping the method in mind when studying the progress of their patients, rather than leaving it to be considered after all other means have failed.

PHLEBOLITHS*

By JAMES R. DILLON, M. D.
AND
BERNARD A. CODY, M. D.
San Francisco

DISCUSSION *by H. A. Rosenkranz, M. D., Los Angeles; Robert V. Day, M. D., Los Angeles; W. P. Willard, M. D., San Francisco; R. L. Rigdon, M. D., San Francisco.*

PHLEBOLITHS have been recognized by pathologists and anatomists for many years as realities, but not until the advent of the x-ray did they become of clinical interest. Rokitansky described phleboliths from an anatomic standpoint in 1856, as occurring most frequently in the periprostatic plexus in males and in the pampiniform plexus in females. The early investigators noted small round shadows in their roentgenograms of the pelvis which they could not satisfactorily explain, and the failure of surgeons always to find supposed ureteral stones led Tuffier in 1897, and Kolisher and Schmidt in 1901, to use a shadow-casting ureteral stilette for facilitating the diagnosis of ureteral and renal diseases. That phleboliths themselves cast shadows was not proven until 1908 by Clark and Orton, working independently. With the improved cystoscopic technique, the use of shadow-casting fluids to obtain pyelograms and ureterograms, and the use of the stereo, the diagnosis of them has become very accurate and rendered them important, especially to the roentgenologists and urologists. They are also of clinical importance to the surgeon and internist in that their shadows should indicate the necessity of a complete urological and cystoscopic examination if renal and ureteral disease is suggested.

RECENT LITERATURE

A recent report by Culligan in looking over 1555 consecutive roentgenograms of the pelvis at the Mayo Clinic, showed phleboliths in 38.99 per cent. The average age was 37.03 years, youngest 16: 59.2 per cent males and 40.8 per cent females. He stated they were found in the veins of the perivesical and periprostatic plexuses in males and in the perivesical and uterine plexuses in females, also occasionally in the veins of the spleen.

Culligan states a phlebolith grows from a central nucleus which arises in a thrombus. He also quoted Pulford that phleboliths occur in 2 per cent of hemangiomas, which could indicate that stasis can be a factor in their formation without infection. The relatively greater frequency of phleboliths in males gives infection a rôle, because of the frequent specific and nonspecific infection of the prostatic ducts supplying secondary infection to the adjacent plexus of dilated tortuous veins where stasis already exists, resulting in the formation of thrombi, which later calcify as a healing process. The absence of muscular support around these veins favors stasis and may help to produce thrombi. Thrombi in other parts of the body are probably better nourished and continue to exist as thrombi, while healing and calcification occur if the thrombi are undernourished. The chief factors in the formation of phleboliths are therefore lack of muscular support to the veins, stasis, undernourishment and healing by calcification.

Gynecologists have recognized for years the symptoms arising from varicose ovarian veins, and Clark in 1902 described relieving a woman of pelvic pain by cutting and ligating the ovarian veins, after tracing them into the pelvis and finding them enormously distended and containing five small phleboliths, lying encapsulated in the veins. He did not remove the phleboliths. In general, to date phleboliths have been treated as inert and symptomless incidentals. The frequent occurrence of patients complaining of pains in the lower abdomen, pelvis and hips, with no logical explanation of the symptoms, but with shadows of large and frequently multiple phleboliths in the region of the symptoms, caused us to doubt their innocence in all cases, and to start an investigation to determine the possibility of symptoms coming from them. The reports of various authors fairly definitely establish the fact that the presence of phleboliths indicates varicosities. If varicosities can cause pain in the legs and testicles, they can also cause it in the pelvis and abdomen, as has already been proven by the gynecologist.

ANALYSIS OF CASES

The data used in this paper were obtained from the x-ray files and the clinical histories of patients of the Stanford University Medical School. There were pelvic films of 900 patients, 286 or 31.7 per cent of whom showed phleboliths. Of this latter group 135 were private cases in which histories were not available and only an incomplete analysis could be made of the data given on the x-ray order slip. The other 151 cases came from the clinic where more or less complete histories were available. The average age was forty-nine and the youngest was twenty. Patients showing phleboliths *only* in their pelvic x-rays seemed to occur more frequently in the second and third decades. In the later decades there were more complications, particularly hypertrophic arthritis of the spine and genito-urinary disease in both male and female, to which the patients' complaints could be more likely attributed.

Of the 135 private cases which showed phleboliths, there were sixty-one sent in for x-ray of the pelvis, lumbar spines or sacro-iliac regions. Twenty-eight of these showed nothing in the x-rays but phleboliths, the other thirty-three showed in addition to the phleboliths, hypertrophic arthritis, old fractures of the pelvis and

* From the Division of Urology, Stanford University Medical School.

* Read before the Urology Section of the California Medical Association at the Fifty-Sixth Annual Session, April 25-28, 1927.

femur, and possible ureteral stones. The other seventy-four cases were sent in for lower quadrant abdominal pains with requests for plain x-ray of the abdomen and urinary tract particularly, with forty pyelograms. Of this number, twenty-four showed phleboliths as the only x-ray finding, the others showing ureteral or kidney stones, hypertrophic arthritis or malignancy. This group of private cases was of no particular value to us, because of the impossibility of getting histories from the private doctors, but it is interesting to note the high incidence of phleboliths without other x-ray evidence of disease.

There were 151 cases having x-ray films showing phleboliths which had more or less complete histories in the Stanford out-patient clinics. An analysis of this group showed 59 per cent males and 41 per cent females. All but two of the entire number of female patients showing phleboliths gave a history of genito-urinary involvement, which included infections and pregnancies. There was a history of urinary tract involvement in 66 per cent, practically all of a nonspecific infection. In the female group there were very few histories giving gonorrhea as the infecting organism. The youngest woman was twenty-one, and the largest number of complaints were found in the second and third decades. In the male group 50 per cent admitted gonorrhea at some period in the history, and 26 per cent showed a present nonspecific infection of the urinary tract, mostly of chronic nature. The remaining 24 per cent of males did not show or admit urinary tract infection.

There were fifteen cases, twelve males and three females, that showed phleboliths in the x-ray pictures of their pelves as the only tangible clue to the cause of their complaints. The most common symptom was pain, as a rule, in the lower quadrants, sometimes radiating to the testicle on the side of the pain in the males. In seven of them the pains came in severe, acute attacks, simulating ureteral stone colic. Five out of this seven showed unilateral phleboliths on the side of the pain, while the other two showed phleboliths on both sides of the pelvis. Urological and cystoscopic examinations were negative. The urine in most of them showed an occasional pus cell, and one showed several blood cells. Practically all of them complained of some frequency and nocturia during attacks. Two had nausea and vomiting with the lower abdominal pain, but had negative gastro-intestinal and gall-bladder x-rays and negative laboratory studies as well as negative urological and cystoscopic examinations. Three patients were diagnosed and treated as neurotics after all clinical and laboratory examination proved negative, though each had phleboliths in the region of their complaints.

There were eight chronic cases whose pain had lasted from one to three years, most of the time as a dull pain in the pelvis with occasional attacks of a more acute nature, though two complained of pain more in the region of the hip. In six of the chronic cases the phleboliths were unilateral and on the same side as the symptoms, in the other two the symptoms were unilateral with bilateral phleboliths. Three of these had occasional attacks of urinary frequency, but showed only occasional pus cells.

There were several other cases showing phleboliths on the same side as their symptoms, but were not included in the above group, because other complications were present which could also account for their symptoms, though we feel that the phleboliths must have been responsible in some of them.

CONCLUSION

1. Phleboliths themselves may not cause symptoms, but their presence indicates a varicose condition of the pelvic venous plexuses.

2. As varicosities cause symptoms elsewhere in the body, it is reasonable to assume they can also in the pelvis and lower abdomen.

3. There are undoubtedly many cases of pelvic varicosities in which phleboliths have not developed, but which cause symptoms, either by stasis or acute thromboses, explaining many cases of obscure lower abdominal and pelvic pains in both men and women.

4. The fact that phleboliths were shown in fifteen cases to be on the same side and in the region of the symptoms, and also the only positive data obtained, convinced us that they represented some, if not all the responsibility for the symptoms.

5. The close proximity of the pelvic plexuses to the bladder and ureters explains the frequency of bladder and kidney symptoms with negative urological and cystoscopic findings.

6. As the chief factors in the formation of phleboliths are lack of muscular support to the vein, stasis, undernourishment, infection and calcification, treatment should be directed toward the correction of these factors by massage, hydro- and electrotherapy, and diathermy; and in women by the addition of pelvic and perineal surgery where indicated.

490 Post Street.

DISCUSSION

H. A. Rosenkranz, M. D. (1024 W. P. Story Building, Los Angeles)—Doctor Dillon's very instructive paper should make us mindful of the significance of varicose conditions, phleboliths or both, when seeking the diagnoses of obscure cases of pelvic or low back pain. The regularity of occurrence of phleboliths was first impressed upon me while dissecting in the Moabit Hospital in Berlin under Professor Benda some thirteen years ago. I was supplied with a new cadaver every day, and found in the periprostatic plexus phleboliths in nearly all cases. I also encountered calculi in the vesicles in this region. Urologists frequently meet with sand and small calculi while enucleating tumors of the prostate. I believe that they are the calcifications of infectious foci, since in these prostatic tumors small pinhead-sized abscesses are occasionally seen on section.

That phleboliths are more common in males is partly due, I believe, to the fact that the males, leading a more strenuous life, lifting, straining, etc., are more subject to thromboses.

Doctor Dillon's recommendation of physiotherapy in the amelioration of varicose conditions is most logical. Although it might be considered rather too speculative at the present time to operate primarily for phleboliths or varicose conditions, it would be well

for surgeons to bear this condition in mind when doing fixations, suspensions, etc., and to correct this pathology when found.

❀

ROBERT V. DAY, M. D. (412 West Sixth Street, Los Angeles)—Doctor Dillon's important piece of research is unique. It seems that heretofore phleboliths had for us no significance except that with the unwary one might be mistaken for calculus. I trust that Doctors Dillon and Cody will continue their study.

❀

W. P. WILLARD, M. D. (380 Post Street, San Francisco)—This paper opens a line of thought upon a condition that occurs so frequently that we have paid no attention to it.

If phleboliths are an indication of varicosities and this condition is responsible for pain, then the hemorrhoidal plexus should cause pain frequently.

Here we have everything present. A near source for infection, stasis, and trauma, but, strange to say, very seldom pain.

I think it hardly fair to compare varicose conditions in the legs and scrotum to pelvic varicosities.

In analyzing the material presented a great deal is left to the imagination, certainly too much to warrant the drawing of any conclusions.

However, the condition offers something to refer to when we are unable to make a diagnosis.

❀

R. L. RIGDON, M. D. (909 Hyde Street, San Francisco)—Pain in the pelvic region is common in both male and female patients, and after we have made our most painstaking examination, and have assigned the cases to the recognized diagnostic groups, there still remains a considerable number that refuse to be classified.

Doctors Dillon and Cody have given us an additional grouping, and by that much have diminished the number of unassignable cases. This makes for confidence in the advice we give and cannot help but be a comfort both to patient and doctor. If time and a common experience prove their theory to be correct, we will have just reason for congratulating the authors.

THE LURE OF MEDICAL HISTORY*

CONTRIBUTIONS OF AMERICA TO SURGERY

PART II

Nineteenth Century

By HAROLD MAYO F. BEHNEMAN, M. D.
San Francisco

And now we come to the *founder of operative gynecology,* JAMES MARION SIMS (1813-1883) of South Carolina. His book, "The Story of My Life," will absorb your interest for an evening. It is full of not only his experiences, but of his thoughts and reflections upon the people and the times. His was a full career; he created a profound impression in the countries of the Old World, and lived a long and useful life. There are amusing and entertaining anecdotes I wish could be quoted here that you will find in his book. They give color to a life of work and high ambition. Among his outstanding contributions were the curing of vesicovaginal fistula (a condition previously irremediable), "Sim's" speculum, and "Sim's" position, and numerous appliances. In 1856 he devised the operation of colporrhaphy for relief of descensus uteri, cystocele, and rectocele. All were of incalculable benefit. He spent some time in Europe in later life, and in Germany he was held in high esteem. His "Clinical Notes on Uterine Surgery" (1866) was translated into German, as were numerous articles. Garrison describes him as one of the most gifted and original of American surgeons. Bryant Park in New York contains a statue erected to his memory.

WALTER BURNHAM of Lowell, Massachusetts, in 1853 performed the *first hysterectomy* for uterine fibroids on record.

EDMUND RANDOLPH PEASLEE (1814-1878) of Hanover, New Hampshire, was professor of anatomy and physiology at Dartmouth. He held the same position later in the New York Medical College, and while there in 1854 advocated and adopted the principle of drainage and intraperitoneal irrigation after ovariotomy, twenty years before Lister propagated his doctrine. In 1874 he was named professor of gynecology in Bellevue Hospital Medical College.

ISAAC E. TAYLOR did an original operation for rectovaginal fistula in 1856.

The honor of *first using antisepsis in Chicago* goes to EDMUND ANDREWS (1824-1904). One of his most notable labors was the study of the relative dangers attending the induction of anesthesia. He was one of the founders of the Chicago Medical College, the Michigan State Medical Society, *The Peninsular Journal of Medicine and Collective Sciences,* the Chicago Academy of Science, and Michigan University Museum.

Among the leaders in American surgery was HENRY JACOB BIGELOW (1816-1890) of Boston, Massachusetts, professor of surgery in Harvard Medical School and surgeon to the Massachusetts General Hospital for over forty years. Dr. Reginald Fitz said: "His lectures were models of condensed thought and applied knowledge," [13] "Doctor Bigelow made two contributions to the science and art of surgery which gave him lasting fame—the bloodless reduction of the hip-joint, and his methods of reducing dislocation." [6] "So great was his influence, it might almost be said that during his professional career he founded in New England a school of surgery." [13] He gave the first accurate description of the ileofemoral ligament of the hip-joint and its significance in the reduction of dislocations, in 1869. It should be remembered, however, that WILLIAM W. REID of Rochester, New York, had previously, in 1851 to 1855, shown in his classic papers many facts afterward more completely described by Bigelow. We owe much to Bigelow for his efforts to establish the administration of ether as a permanent part of operative technique. He also greatly advanced the technique of bladder surgery.

Tragically ended was the short life of HORACE WELLS (1818-1848) of Hartford, Connecticut, whose name is so intimately connected with the history of nitrous oxid anesthesia. He experimented with this drug in dentistry, but failed to establish its successful use. He died at the young age of thirty-three years by his own hand, de-

* This is the second of two papers on this subject. The first paper was printed in this journal in last month's issue.